

CLAIMS

The invention claimed is:

1. A thin film keypad comprising:

a retainer sheet made of a thin film material and having a top and bottom surface, said retainer sheet including:

at least one hole extending through said thin film material; and

at least one retainer anchor portion formed from a portion of said thin film material extending upwardly from said top surface; and

at least one keycap molded onto a top surface of said retainer sheet and around said retainer anchor portion, said keycap including a keycap anchor portion molded through said hole in said thin film material such that said keycap anchor portion and said retainer anchor portion mechanically secure said keycap to said retainer sheet.

2. The thin film keypad of claim 1 wherein said thin film material is a plastic material.

3. The thin film keypad of claim 1 wherein said thin film material is selected from the group consisting of a polycarbonate material and a polyester material.

4. The thin film keypad of claim 1 wherein said thin film material has a thickness in a range of about .005 in. to .010 in.

5. The thin film keypad of claim 1 wherein said thin film material has a thickness of about 0.005 in.

6. The thin film keypad of claim 1 wherein said keycap is made of a plastic material.

7. The thin film keypad of claim 1 wherein said keycap is made of a material selected from the group consisting of polycarbonate, polycarbonate/ABS blend, and ABS.

8. The thin film keypad of claim 1 wherein said keypad is used in an electronic device, and said keycap anchor portion is configured to be an actuator.

9. The thin film keypad of claim 1 wherein said keycap is made of an ABS material, and wherein said thin film material is a polycarbonate material.

10. The thin film keypad of claim 1 wherein said keycap anchor portion is secured against said bottom surface of said retainer sheet.

11. The thin film keypad of claim 1 wherein said retainer anchor portion includes a flap cut out from said thin film material.

12. A thin film keypad comprising:

a retainer sheet made of a thin film material and having a top and bottom surface, said retainer sheet including a plurality of keycap attachment regions; and

a plurality of keycaps molded onto a top surface of said retainer sheet at respective said keycap attachment regions, wherein said keycaps are molded around portions of said thin film material such that said keycaps are mechanically secured to said retainer sheet.

13. The thin film keypad of claim 12 wherein said retainer sheet includes holes extending through said thin film material at said keycap attachment regions, and wherein said portions of said thin film material around which said keycaps are molded include edges of said thin film material around said holes.

14. The thin film keypad of claim 12 wherein said portions of said thin film material around which said keycaps are molded include flaps cut out from said thin film material and extending upwardly from said top surface.

15. The thin film keypad of claim 12 wherein said thin film material is a plastic material.

16. The thin film keypad of claim 12 wherein said thin film material is selected from the group consisting of a polycarbonate material and a polyester material.

17. The thin film keypad of claim 12 wherein said thin film material has a thickness in a range of about .005 in. to .010 in.

18. The thin film keypad of claim 12 wherein said thin film material has a thickness of about 0.005 in.

19. The thin film keypad of claim 12 wherein said keycap is made of a plastic material.

20. The thin film keypad of claim 12 wherein said keycap is made of a material selected from the group consisting of polycarbonate, polycarbonate/ABS blend, and ABS.

21. The thin film keypad of claim 12 wherein said keycap is made of an ABS material, and wherein said thin film material is a polycarbonate material.

22. A method of making a thin film keypad comprising:
forming at least one keycap attachment region on a thin
film material, each said keycap attachment region including at
least one molding material passage region;
placing said thin film material into a molding tool having
at least one keycap mold cavity such that each said molding
material passage region is located within each said keycap mold
cavity, respectively;
injecting a molding material through said molding material
passage region in said thin film material and into said keycap
mold cavity such that at least one keycap is molded onto a top
surface of said thin film material, and wherein said molding
material flows around a portion of said thin film material such
that said keycap is mechanically secured to said thin film
material.

23. The method of claim 22 further including cutting an
outline of a retainer sheet from said thin film material such
that said keycap is molded onto said retainer sheet.

24. The method of claim 22 wherein said molding material
is selected from the group consisting of polycarbonate,
polycarbonate/ABS blend, and ABS.

25. The method of claim 22 wherein said thin film material is selected from the group consisting of a polycarbonate material and a polyester material.

26. The method of claim 22 wherein forming each said keycap attachment region includes forming at least one hole through said thin film material, and wherein said retainer sheet is placed in said molding tool with said hole positioned between said keycap mold cavity and an anchor mold cavity such that said molding material flows through each said hole and around an edge of said thin film material.

27. The method of claim 22 wherein forming said keycap attachment region includes cutting at least one flap from said thin film material to form said material passage region, and wherein said molding material flows around each said flap.

28. The method of claim 27 wherein said molding tool includes a gate for injecting said molding material, and wherein inserting said retainer sheet into said molding tool includes inserting said gate through said material passage region such that said gate moves said flap into said keycap mold cavity.

29. A method of making a thin film keypad comprising:
forming a plurality of keycap attachment regions on a thin
film material, each of said keycap attachment regions including
at least one hole and at least one material passage region;
placing said thin film material into a molding tool
including a female side having keycap mold cavities and a male
side having anchor mold cavities, wherein said retainer sheet is
positioned such that said holes are located between respective
said keycap mold cavities and said anchor mold cavities and such
that said material passage regions are located within respective
said keycap mold cavities; and

injecting a molding material through said material passage
regions in said thin film material and into said keycap mold
cavities, wherein said molding material flows through said holes
and into said anchor mold cavities such that keycaps are molded
onto a top surface of said thin film material and are
mechanically secured to said thin film material.

30. The method of claim 29 wherein said thin film material
is selected from the group consisting of a polycarbonate
material and a polyester material, and wherein said molding
material includes ABS.

31. The method of claim 29 wherein forming said material passage regions includes cutting flaps from said thin film material, wherein said male side of said molding tool includes gates for injecting said molding material, and wherein inserting said thin film material into said molding tool includes inserting said gates through respective said material passage regions such that said gates move respective said flaps into respective said keycap mold cavities and said molding material flows around said flaps.

32. The method of claim 29 wherein forming said material passage regions includes forming formed hole portions from said thin film material, wherein said male side of said molding tool includes gates for injecting said molding material, and wherein inserting said thin film material into said molding tool includes inserting said gates through respective said material passage regions such that said molding material flows around said formed hole portions.

33. The method of claim 29 further including cutting an outline of a retainer sheet from said thin film material such that said keycaps are molded onto said retainer sheet.